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REVIEW OF SECTORAL CLUSTERS, SECOND PHASE: LAND, DESERTIFICATION, FORESTS AND BIODIVERSITY

Managing fragile ecosystems: sustainable mountain development

Report of the Secretary-General

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ABBREVIATIONS

CGIAR	Consultative Group on International Agricultural Research
CIFOR	Centre for International Forestry Research
CIP	International Potato Centre of CGIAR
CIMMYT	International Maize and Wheat Improvement Centre
CNRS	National Centre for Scientific Research of France
CONDESAN	Consortium for Research and Development in the Andean Ecoregion
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
IACSD	Inter-Agency Committee for Sustainable Development
ICALPE	International Centre for Alpine Environment
ICIMOD	International Centre for Integrated Mountain Development
ICRAF	International Centre for Research in Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
ILCA	International Livestock Centre for Africa
ILO	International Labour Organization
IMS	International Mountain Society
IUCN	The World Conservation Union
IUFRO	International Union of Forest Research Organizations
MAB	Man and the Biosphere programme
NGO	Non-governmental organization
TFAP	Tropical Forests Action Programme
TMI	The Mountain Institute (formerly Woodlands Mountain Institute)
TSS-1	Technical support services at the programme level

UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNU	United Nations University
WCMC	World Conservation Monitoring Centre

INTRODUCTION

1. The present report describes the progress made in the implementation of the aims set out in chapter 13 of Agenda 21 (Managing fragile ecosystems: sustainable mountain development) 1/ since the United Nations Conference on Environment and Development (UNCED) in June 1992, and contains a set of recommendations for action. The report was prepared by the Food and Agriculture Organization of the United Nations (FAO) as Task Manager for chapter 13 of Agenda 21 in consultation with the United Nations Secretariat and in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD) at its fourth session. At the Conference, Governments recognized mountains as an important source of water, energy and biological diversity, as well as a source of such key resources as minerals, forest products and agricultural products and of recreation. It was realized that mountain ecosystems were essential to the survival of the global ecosystem and that about 10 per cent of the world's population depended directly on mountain resources, with a much larger percentage (estimated at 40 per cent of the world's population) drawing on other mountain resources, including in particular water (it is estimated that mountains are the source of about 80 per cent of the world's water resources).

2. Chapter 13 of Agenda 21 contains two programme areas for action: (a) generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems; and (b) Promoting integrated watershed development and alternative livelihood opportunities. However, while the two areas have their particular significance, in the present report they are treated together, with special emphasis on the need for an integrated ecosystems approach to sustainable mountain development.

3. The network established during the first ad hoc inter-agency meeting on chapter 13 of Agenda 21, held in Rome on 21 and 22 March 1994, has developed a set of proposals for action by United Nations organizations, as well as by international non-governmental organizations (NGOs) involved in sustainable mountain development. It has been generally agreed that a special effort will be needed to move the "mountain agenda" higher on the international and national development agendas. The above-mentioned NGOs have agreed to recognize chapter 13 of Agenda 21, as adopted by the Conference, as a basis for action and to participate in mountain development programmes in a spirit of cooperation with Governments. With the encouragement of the United Nations inter-agency group on mountains, a global conference of intergovernmental and non-governmental organizations is to take place in February 1995, in addition to the series of regional intergovernmental consultations that began in December in the Asia and Pacific region and will continue in Latin America and the Caribbean in April 1995. Consultations in Africa, Europe and North America could take place later in 1995 and in 1996.

4. Although many important urban-based development activities occur in mountains, the present report concentrates mainly on new approaches concerning the integrated management of the natural resource base, the interaction between rural mountain populations and resources in terms of sustainable livelihoods,

and efforts to ensure environmentally sound and sustainable development of mountain areas.

I. GENERAL OVERVIEW

A. Mountain issues, identified gaps and opportunities for action

5. Mountain ecosystems and environments are of critical importance as water stores. They are often physically unstable (subject to earthquakes, landslides and volcanic and torrential phenomena) and sometimes plentiful in mineral resources. Biologically, mountain ecosystems are characterized by altitudinal zonation and microclimatic "niches" generating a rich but fragile biological diversity. Characteristically, human communities in mountains are self-reliant and have a detailed knowledge of the ecosystems on which they depend and of how to utilize them. Cultural diversity and richness parallel the biological diversity, and the specific sacred and/or religious significance of the mountains themselves is often a prominent cultural feature.

6. The complexity and diversity of mountain ecosystems make it difficult to generalize. The need for a comprehensive, interdisciplinary approach to sustainable mountain development with the effective participation and empowerment of mountain people has been recognized, as has the need to further increase awareness at all levels of society of the importance of mountain ecosystems, together with their problems and potential. The prevalence of absolute and relative poverty in mountainous regions and the downstream consequences of the degradation of mountain ecosystems are recognized as major reasons for mobilizing international efforts to assist countries 2/ to formulate and implement strategies for sustainable mountain development. A priority will be to develop and test potentially replicable models for rural poverty alleviation 3/ that can overcome the obstacles facing populations in upland areas and ease their transition to more sustainable livelihoods. These should build on local knowledge, capacities and opportunities, suggesting in turn that for mountainous regions, multiple adaptive models are likely to be more successful than approaches based on a uniform development paradigm.

7. There is a general lack of suitable institutional mechanisms to ensure an integrated approach, in view of the complexity of mountain ecosystems and the socio-economic issues at stake. In addition, there is scope for improved policy and legislation for mountain areas, as well as for training and capacity-building, to make the implementation of chapter 13 of Agenda 21 possible. The need for long-term projects and programmes and long-term monitoring of their environmental benefits is emphasized.

8. Linkages between traditional knowledge and practices and their effect on ecosystems should receive more attention. Linkages between data collection and research, and the utilization and application of results need reinforcement. A recurrent issue is the plea for more action-oriented data collection and research linked to specific pilot areas where different government agencies and non-governmental organizations could coordinate interventions. Research should also be more responsive to the needs and aspirations of mountain populations.

Improved information systems, networking and accessible databases have been identified as a priority area for action.

9. Traditionally mountains have had their natural and human resources drained to benefit the lowlands. At present, however, mountainous countries can support their upland programmes to a greater degree by channelling some returns from mountain-derived benefits (such as hydropower, mining, forestry, tourism), where appropriate, back into the uplands. The empowerment of mountain communities, including increased control over local resource conservation and management, in order to become more directly involved in income-earning activities, is seen as a necessary step in a strategy for sustainable mountain development.

B. Difficulties encountered

10. One of the main difficulties encountered so far is the failure to see mountain areas as something special, with a potential of their own and therefore worthy of special attention. This is reflected in the lack of mountain programmes of agencies, but maybe even more so at the national level, where it is still rare to find departments, programmes or legislation dealing in a comprehensive way with mountain issues. More often than not mountain areas and populations are at the "thin end" of general national programmes of education, health, infrastructure and the like, mainly because the cost per person of providing such services in remote mountain areas is above the national average and therefore seen by sectoral agencies as uneconomical, and because of inadequate recognition of the value of mountain natural resources. Hence in addition to ongoing sectoral efforts there is a need for comprehensive programmes, at the national and international levels, designed specifically for mountain areas or, even better, originating in mountain areas.

C. Time-frame

11. Mountain cultures are old, sometimes very old. National and international programmes in the mountains have been ongoing for decades. It should be stressed that international consultations on sustainable mountain development as a follow-up to UNCED will take time. The "mountain agenda" will therefore need special emphasis in order to realize the national planning, legislation and investments called for, and even then only partial realization of this critical agenda can be envisioned. Emphasis should therefore be placed on the formulation and installation of flexible, long-term, support mechanisms, with the mountain populations themselves playing the lead role and determining the timetable. However, in such areas as poverty alleviation, management of natural resources and capacity-building, significant progress and greater support is urgently needed.

D. Development models

12. The Consortium for Research and Development in the Andean Ecoregion (CONDESAN), has provided a novel approach to mountain development research by looking at mountain issues in a comprehensive ecosystemic way and being open to different partners in a collaborative effort. Working at the local level, the approach is that of an "open consortium", involving a group of Andean government agencies working together with one or several NGOs under the general coordination of an informal "committee" in which all participating organizations are represented.

13. The Tropical Forests Action Programme (TFAP) has gone through a series of revisions and modifications since being launched in 1985, but has proved to be a survivor. It has so far involved more than 90 developing (not necessarily tropical) countries. It has developed mechanisms for participatory programme development and public debates concerning the contribution of the forestry sector to national development, which would be suitable for the formulation of mountain action programmes as well.

14. In addition to these two examples, a wealth of ongoing and recent operational models for community-based natural resource conservation and management are being introduced and tested. These include programmes of national and international NGOs, such as the King Mahendra Trust for Nature Conservation (Nepal), the Aga Khan Rural Support Programme (Pakistan) and The Mountain Institute (TMI) (Himalayas and Andes); Intergovernmental organizations, such as FAO, the International Fund for Agricultural Development (IFAD), the International Centre for Research in Agroforestry (ICRAF) and the International Centre for Integrated Mountain Development (ICIMOD); and many national Governments, with or without external support.

II. REVIEW OF PROGRESS ACHIEVED, MAIN POLICY ISSUES AND EXPERIENCES

A. Country experiences

1. Developed countries

15. In mountain areas, the main challenges faced by industrialized countries relate to depopulation, abandonment of sustainable systems of natural resource management (e.g., forests and mountain pastures), the increasing use of land for recreational activities, and the provision of protection from natural hazards.

16. Depopulation of mountain areas - in Europe, most notably in France and Spain - is often a result of the creation of economic opportunities in the lowland industrial and urban centres, combined with the failure to generate sufficient employment and improved livelihood opportunities in the mountains. In Australia, Canada, New Zealand and the United States of America, for example, "modernization" in pastoral management has led to a withdrawal from marginal range land and pasture land that are no longer needed or have become uneconomical to graze.

17. The process of depopulation is at present being reversed by important investments in infrastructure for tourism and recreation. Some mountain areas have become attractive and expensive ski resorts (Aspen, Colorado, United States of America; Cortina d'Ampezzo, Italy) or popular to the point where artificial snow and light (in Japan for example) must be provided for skiers 24 hours a day in order to meet the demand. This in turn is leading to the need to construct super highways, hotels, ski lifts and so forth and to reshape mountain slopes to make ski runs, thereby creating new environmental pressures.

18. The shift from peasant agriculture to the tourist industry has led to a jump in demand for safety measures against natural phenomena. The original population would remain indoors during a blizzard and would be familiar with the snow and weather conditions and the increased risk of avalanches. The majority of mountain tourists however, require roads to remain open at all times, and are unaware of the rapid weather changes in mountains. The investments in torrent and avalanche control measures to protect visiting tourists are many times greater than those needed to protect the original population.

19. At the same time it has become increasingly difficult to establish and maintain stable forest and range vegetative cover with adequate protective functions. Many mountain areas in industrialized countries were artificially afforested or reforested in the nineteenth century. Today these plantations and the remaining more or less natural forests suffer from lack of silvicultural interventions, overmaturation and inadequate control of excessive wildlife populations (which, in addition to being a generally uneconomical activity, is not appreciated by the general public), and new environmental conditions such as air pollution and the threat posed by climate changes.

20. In view of the perceived threat to mountain forests, the European countries participating in the Strasbourg Ministerial Conference on Forest Protection in Europe (1990) adopted a resolution on adapting the management of mountain forests to new environmental conditions. This has led to closer collaboration among scientists, practitioners, administrators and legislators on the protection and management of mountain forests, at both national and international levels, and to a review of legislation and increased funding in some countries.

21. So far, however, chapter 13 of Agenda 21 has not had a significant direct influence on policies and programmes of developed countries. However, Japan enacted the "Law concerning the Promotion of the Improvement of Basic Conditions of Agriculture, Forestry and other Businesses in Hilly and Mountainous Areas" in June 1993, and Italy enacted the "New Law for Mountain Areas" in January 1994. There is an increasing understanding in industrialized countries of the need for maintaining mountain populations where they live, in order to ensure sustainable natural resource management and production systems (through subsidies and provision of infrastructure and services), preserve mountain cultures and traditions and prevent and combat forest fires.

22. Support for national development agendas had not yet materialized. It is expected that the regional intergovernmental workshops planned in preparation for a proposed world conference on sustainable mountain development in 1997 (see para. 75 below) will alert Governments and national agencies to the needs and

potential for special national mountain agendas. So far chapter 13 of Agenda 21 has received very limited attention at national level.

2. Developing countries

23. Two conditions make urban migration away from the mountains in developing countries very different from urban migration elsewhere. First, the weak economies of developing countries cannot absorb migrants, many of whom end up in peri-urban slums, and secondly, mountain population densities remain high (relative to carrying capacity and conservation needs) and in many cases are growing.

24. Developing country institutions dealing with mountain development are new compared with, for example, some of the European torrent and avalanche control services dating back more than 100 years. In addition they are usually understaffed and lack adequate long-term funding.

25. Exceptions to this general rule may be found in recent developments in Colombia and Lesotho. In Colombia, the Regional Autonomous Corporations, created by Act No. 99 of 1993, have been made responsible for environmental management. The great majority of these Corporations are situated in the Andes, thus providing a high degree of autonomy to the mountain areas of the country. In Lesotho, the Highland Water Development Scheme, which involves the construction of four major dams and water conduits for the sale of water to South Africa constitutes the most important investment and potential sustainable income earner for the country, which is all mountainous. The state of Himachal Pradesh in India has made significant progress in economic development by transforming a subsistence food production economy into a market economy based on opportunities for horticultural development in a mountain environment.

26. Several developing countries have made significant progress in participatory rural development and watershed management in the uplands, compared with the industrialized countries in temperate zones. The main reason is that the mountain areas in tropical and subtropical countries are often densely populated in areas where farming, even at altitudes higher than 3,000 metres above sea level, is still possible. The participatory techniques in community forestry, soil and water conservation and watershed management include grass-roots participation and bottom-up planning methods, which are currently being applied in a large number of programmes in a variety of situations. 4/

27. In general, although a wide range of activities are ongoing in mountain areas in developing countries, few if any, can be considered as being initiated or strengthened as follow-up to chapter 13 of Agenda 21. On the other hand, several initiatives, although not a direct follow-up to chapter 13, have the potential to become the first steps towards a comprehensive "national mountain agenda". The Government of Viet Nam is developing a strategy for the uplands and watersheds inhabited by ethnic minorities. Other countries have relevant past experiences such as Ethiopia (Highlands Rehabilitation), Morocco (rural development in the province of Azilal), and Guinea (Fouta Djallon). Much remains to be done, however, to create awareness among developing country

planners and policy makers of the potential for mountain development and the specific requirements related to mountains.

3. Countries with economies in transition

28. The problems related to mountain areas of countries with economies in transition are in many ways similar to those of industrialized countries. Urban migration and neglect of forest management interventions, however, are further exacerbated by the very high levels of air pollution, structural changes that have affected institutional capacity, and limited experience with multisectoral participatory planning.

29. As a follow-up to the Strasbourg and Helsinki Ministerial Conferences on Forest Protection in Europe, the Czech Republic has convened two international meetings on the protection of watershed forests affected by air pollution. In 1993, acting on the recommendation of those meetings, the Government of Poland organized a national conference on environmental threats to the Western Sudeten forests. A proposal has been made to establish a centre for the restoration of degraded mountain environments in Hercynian mountains.

B. Experience of major groups and non-governmental organizations

1. Farmers

30. Farmers in the mountains include members of indigenous communities and subsistence farmers practising shifting cultivation. There are small-scale family farms, medium- and large-scale plantations (forest, fruit trees) and livestock farms and enterprises. Geographically consolidated mountain farm units with legal title to land are relatively rare. Instead, the income of the farm family is generally based on a great variety of activities, including livestock, mixed cropping from several small scattered plots, gathering of forest products, hunting and fishing, off-farm employment, cottage industries and handicrafts and tourism.

31. Because of the multi-faceted sources of income of mountain farmers, traditional sectoral extension services have not usually reached them, either because of their remoteness and scattered locations, or because the production units in each production line (coffee, tea, grains, livestock, fruit) are considered too small. In addition, because of the generally insecure income and land tenure situation, they have not usually qualified for normal credit schemes. Mountain farming furthermore relies on the exploitation of highly variable and complex ecological niches, where local knowledge is often superior to what extension agents can offer based on research and experience derived from extensive lowland farming systems. Without increased research geared to their specific requirements (such as the work carried out by the International Potato Centre (CIP) of the Consultative Group on International Agricultural Research (CGIAR), among others), mountain production systems are unlikely to benefit from further extension services.

32. Some progress is being made to overcome the above problems through special upland integrated development programmes involving group credits, multi-purpose extension agents at the village level, forest occupancy agreements, farmers' associations and the like. Much needs to be done, however, to further develop promising experiences of past and existing pilot schemes and demonstration projects, and apply the lessons learnt.

33. The dramatic increases in agricultural production following the "green revolution" and the privatization of agriculture in countries with centrally planned economies have not significantly benefited mountain farmers. The agricultural services and secure land tenure available to lowland farmers are generally not available to upland farmers, whose needs are different. Much of the green revolution technology does not work properly in uplands and in areas lacking improved access. Although a few practices, such as stall feeding of animals, planting of leguminous trees and vegetative barriers against erosion, have general application, local solutions of an integrated nature are usually required.

2. Women, children and youth

34. The number of migrant labourers originating in mountain areas - practically every family in the Atlas Mountains of Morocco and in the Maloti Mountains of Lesotho has a male family member working elsewhere - and the high birth rates in some already densely populated mountain areas (the Andes and the Himalayas in particular) make women a particularly important group to be involved in the design and implementation of mountain development programmes.

35. Frequently, when the male head of household is away, the women who are left behind to manage the family, the animals and the land do not have the necessary authority to make decisions. In other situations, women cannot participate in meetings away from the home or find it impossible to face the prospect of further investment of their time and efforts because they are already overloaded with responsibilities.

36. Some Governments and development agencies are starting to address these issues by making sure that women participate in programme design from the very early stages, although they often fail to make adequate provision for the additional initial efforts, and therefore costs. On the other hand, mountain women, once organized, and perceiving that they are able to benefit, are often very active in development activities despite their busy schedule. Increased sensitivity to gender issues among development workers and experts is urgently required.

37. The FAO/Italy Interregional Project for Participatory Upland Conservation and Development commenced work simultaneously in five countries in 1991 (Bolivia, Burundi, Nepal, Pakistan and Rwanda). In all cases the international project design team consisted of a male and a female member, and had a period of three months in which to design the project, in consultation with the watershed populations following a participatory rural appraisal in order to ensure adequate representation by all groups. During the first two-year phase of the programme, this led to a series of local initiatives, which during the following

three-year phase are being closely monitored and are gradually finding their niche in the evolving multi-stakeholder plan for the watershed. This process represents a complete turnaround from traditional regional planning by government agencies in order to define action programmes often seen as of low priority by the local people.

38. The general situation remains, however, in which mountain families are split for long periods because of the need for income from outside employment. Young people are leaving the mountains to look for a better future elsewhere or are involved in such activities as herding, mining or forestry, which take them away from home for extended periods. Children at an early age are forced to attend to grazing livestock, fetching water, fuelwood and fodder, and looking after younger siblings, instead of attending school (if a school exists). As a result, school drop-out rates are exceedingly high in mountain regions. The challenge in basic education programmes is to adopt approaches that recognize these realities and design programmes that are relevant to the local situation. Not enough has been done to help children and youth to recognize the potentials and constraints of their environment and to take action, together with teachers and parents, for achieving a better livelihood.

39. Although the World Bank in one of its recent annual reports has identified rural women in developing countries as the investment target with the highest potential, financial and other allocations to women, particularly to women in the mountains, remain totally inadequate. The difficulties and obstacles to achieving a greater role for mountain women, a greater contribution from them and their overall participation are formidable. Girls are not encouraged to pursue education beyond primary school and, because of their multiple responsibilities, often remain illiterate as well as culturally constrained in making their opinions known when men are present. Many mountain women speak only the local language, which is often not the official language of the nation let alone an international language. The recommendations of the International Conference on Population and Development specifying measures to be taken for the empowerment, equity and equality of women, and to eliminate discrimination against the girl child, represent the most recent international agreements concerning the status of girls and women. 5/ They should also be implemented in mountain areas.

40. While the involvement of mountain women in the process of achieving sustainable development is strategically important and can be cost-effective, in many cases completely new ways of working with communities are needed. Participatory methods in soil conservation and community forestry increasingly include drawing, dancing and performing plays, which enable women to express their opinions and needs. Further development and large-scale application of such methods are seen as indispensable if real progress is to be achieved.

3. Indigenous people

41. Armed conflicts and other problems involving mountain communities have been given extensive coverage by the mass media and with it some attention to the issue of mountain development as well as the situation of indigenous mountain populations. However, although armed conflicts make more headlines and indeed

represent immense human suffering, it is probably the more gradual encroachment on the mountains by displaced lowland people that has had the most serious impact on indigenous mountain communities over the past four decades. The devastating effects of short-fallow shifting cultivation are often not the work of mountain people, but of landless lowland farmers moving farther up into mountain areas as squatters in search of "unoccupied" land and applying lowland production techniques unsuited to complex upland realms.

42. Sustainable mountain development in many places has to start with a change in attitude towards indigenous people and in the way they are treated. Their right to the land should be recognized, as should their knowledge of the special living conditions and natural resource management in the mountains. They should be protected from exploitation by drug dealers, tourist operators and guerrilla movements. In many countries this involves extremely sensitive issues. However, some progress is being made involving official granting of land titles, granting of partial autonomy, teaching in local languages and so forth. New development models involving indigenous mountain people are appearing; they are badly needed.

4. Non-governmental organizations

43. Non-governmental organizations, including the International Mountain Society (IMS), and people with close NGO contacts working in intergovernmental institutions such as ICIMOD were instrumental and in some instances played a decisive role in ensuring that a special chapter on mountains (chapter 13) was included in Agenda 21 and approved by UNCED. This is recognized in chapter 13, in which it is stated that national Governments and intergovernmental organizations should:

> "(a) Coordinate regional and international cooperation and facilitate an exchange of information and experience among the specialized agencies, the World Bank, IFAD and other international and regional organizations, national Governments, research institutions and non-governmental organizations working on mountain development;
>
> (b) Encourage regional, national and international networking of people's initiatives and the activities of international, regional and local non-governmental organizations working on mountain development, such as the United Nations University (UNU), the Woodlands Mountain Institute (WMI), the International Centre for Integrated Mountain Development (ICIMOD), the International Mountain Society (IMS), the African Mountain Association and the Andean Mountain Association, besides supporting those organizations in exchange of information and experience". 6/

44. International NGOs, such as the World Conservation Union (IUCN), support national and local activities ranging from the formulation of national environmental and forestry action plans, and the establishment of protected areas and national parks, to indigenous people and local user groups, among others. This work is carried out in collaboration with Governments and intergovernmental organizations, as well as with national and local NGOs.

45. National level NGOs play an increasingly important role in mountain development programmes. The Aga Khan Rural Support Programme in Pakistan, the King Mahendra Trust for Nature Conservation in Nepal, and the Fundación Peruana para la Conservación de la Naturaleza in Peru are but a few examples.

46. The number of local NGOs supporting mountain communities has greatly increased, as recognition of and hence support for, their role has gained ground. The increased flow of information to and between local level NGOs has improved the quality of their activities and, in many instances, has helped to clarify their partnership role in development efforts alongside decentralized government agencies.

C. Matters related to finance and technology

1. Finance

47. Sustainable mountain development is still almost entirely financed on an ad hoc project rather than programme basis. Mountains have not yet been the object of special financial mechanisms, although such arrangements would be entirely justified. Mountains do not have an equivalent to the TFAP or an international convention with a financing mechanism such as the Global Environment Facility (GEF). The many attempts to link the construction of large dams and the sale of hydroelectricity and irrigation water with the financing of integrated watershed conservation and development have remained largely frustrated. Recently, however, both the Inter-American Development Bank and the World Bank have become increasingly interested in environmental issues related to natural resources conservation (forests and water) in watershed and mountain areas.

48. Mountain areas are very often poor, not because they do not produce, but because they do not obtain a fair price for their products and services. These include water, forest products and services, tourism and recreation, mining, special upland crops, fruits and animal products (ranging from milk and cheese to clothing and carpets).

49. One of the main sustainable sources of income for mountain areas would appear to be based on new developments concerning water tariffs. Lesotho is at present engaged in a major highland water scheme that will enable the country to sell water to South Africa. This will be one of the first cases of a major financial arrangement in which the value of water as a scarce natural resource will be recognized. Most existing water tariffs are based only on the need to recover the costs of dam construction and delivery systems for example, water being considered a free - unlimited - natural resource.

50. Colombia has for several years applied a financial mechanism for watershed management and upland rural electrification based on a special tax of 4 per cent (now changed to 6 per cent) on the bulk sale of hydroelectricity.

51. At the national level, a new and hard look needs to be taken at the overall flow of resources and services to and from mountain areas, including water, forest and range products, labour, and government services. New or revised

water tariffs, forest and mining royalties, grazing rights and leases, marketing of medicinal herbs and other non-wood forest products, fees for access to national parks and licences for tourism operations are all possible income earners for development action benefiting mountain communities, which would in turn allow these communities to invest in, and not receive as government hand-outs, housing, communication, roads, education and nutrition.

52. Mountain areas can benefit, and in some cases are benefiting, from programmes financed by GEF. GEF, however, is not at present oriented towards mountain development as such, although the international conventions on climate change and biological diversity are important in relation to mountain areas. Other categories eligible for GEF financing, such as international waters and land degradation, are often also pertinent to mountains. Further consideration should be given to financing relevant aspects of mountain development programmes by GEF or other financial mechanisms.

53. In relation to Capacity 21 the special programme of the United Nations Development Programme (UNDP) for strengthening country capacity for the implementation of UNCED decisions), the creation or strengthening of regional and national capacity for the identification and formulation of sustainable mountain development programmes is badly needed.

54. Technical support services at the programme level (TSS-1), a new financial mechanism for UNDP-financing of technical support provided by United Nations specialized agencies, is a potentially useful mechanism for the formulation of mountain development programmes. A UNDP/FAO TSS-1 project in Viet Nam on Watershed Management and Ethnic Minorities, has been useful in improving the design of participatory watershed management projects.

55. Whether it be done in relation to GEF or as part of TFAP on Capacity 21, for example, there is a real and urgent need to define and create special financial facilities for sustainable mountain development. Such financing need not necessarily involve huge amounts of funding but should be long term, dependable and flexible. As the present report demonstrates, many national and international organizations have programmes in mountain areas, and in fact a great deal of money is already being spent on activities involving mountain areas. What appears to be needed is a more systematic approach to investment in mountain areas - in short, programmes involving mountains should be supplemented with "mountain programmes".

56. As a starting point it is proposed to establish one or several "mountain facilities", as small grants funds or multi-donor trust funds, for example. This would allow mountainous developing countries to identify action required under a "national mountain development action programme" and to seek international support for the implementation of such a programme. In the immediate future, increased international funding would be needed to establish pilot projects under such national programmes and significantly increase support for applied and operational research in mountain areas, national and international networking, communication, exchange of experiences and the like. Long-term commitments might be generated through the formulation and negotiation of a non-legally binding mountain charter and through regional or subregional mountain conventions.

2. Technology

57. Mountain areas have benefited from the preparation and implementation of national forestry master plans or national forestry action plans in the framework of TFAP, the Man and the Biosphere (MAB) programme of the United Nations Educational, Scientific and Cultural Organization (UNESCO), national environmental action plans and the FAO International Scheme for Conservation and Rehabilitation of African Lands, for example. However, without a specific focus on mountain issues, mountain areas often find themselves at the back of the queue, with the possible exception of forestry activities, when programme implementation gets under way because of the difficulty of access, lack of basic information (soil surveys, socio-economic parameters) and the need for local comprehensive solutions based on slow participatory processes.

58. Available sources of information on appropriate technology to promote the sustainable development of mountain areas include libraries and databases of FAO, ICIMOD, CIP and other centres of CGIAR, and the World Conservation Monitoring Centre (WCMC). The existing information is accessible to, but not widely disseminated in, developing countries.

59. Road construction in mountain areas, although recognized as a major environmental problem, is still of an unsatisfactory quality in most developing countries. The difference between construction standards of mountain roads in industrialized countries and those in developing countries is greater than would be expected from the differences in costs. The situation is compounded by the fact that poorly constructed mountain roads usually require much higher maintenance costs, and are often ecologically and even culturally damaging.

60. Mining in mountain areas, while potentially an important income-earner, has a history of negative environmental and social impacts. Often mountain communities do not have the necessary financial and technical capacity to establish and manage mining operations, and yet as labourers, mountain people suffer the adverse health impacts of hazardous working conditions, as well as the consequences of the strong fluctuations in demand and prices of metals and minerals on the world market. Progress is needed in three areas: ensuring that an increasing share of mining royalties benefits the local populations; increased social security and health benefits for mining workers; and the mitigation of environmental impacts of mining operations.

61. Urban development in the mountains presents special challenges regarding water supply, air pollution and sewage and waste disposal, among other things. Lack of space may force construction on unstable sites or in areas that should be conserved for water supply catchments on routing of flood waters. This in turn may increase the adverse impact of phenomena such as landslides, mudflows, flash floods or prolonged drought.

62. Traditional irrigation technology in mountain areas has been eclipsed by modern dam construction and the rapid development of large downstream irrigation schemes, generally inappropriate for mountain areas. There is an urgent need to rediscover and re-apply such traditional technologies as the Andean irrigation techniques developed by the Incas as well as mountain civilizations in other regions. Generally speaking, irrigation in the mountains, based on small-scale

appropriate technology, is far more sustainable than the large-scale irrigation schemes in hot climates downstream, with the possible exception of the flood-irrigated lowlands in monsoon climates in Asia.

63. A major development in government policy concerning mountain communities is the increased understanding of the importance of local control over natural resource management and security of resources, especially land tenure, as the main incentives for investment in environmentally sound technologies and improved land husbandry. Much needs to be done, however, before the confidence mountain people lost because of past policies of sweeping nationalizations, concessions to outsiders with limited control and punitive attitudes towards small farmers practising hillside agriculture can be completely restored.

64. Tourism in mountain areas is still far from fulfilling its potential contribution to the local mountain economies. Positive examples exist in Austria (Tyrol) and in Italy (Trento Autonomous Province) and other mountain areas where the benefits of tourism have had a direct impact on the local household economies, and have practically eliminated poverty in such areas. In other areas, tourism has had severe social and cultural as well as ecological impacts. Bhutan is seeking to keep tourism within ecologically and culturally "safe limits" by, among other things, restricting the number of visitors. Regarding developing countries in general, it is worth remembering that (a) not all mountain areas benefit from tourism - it cannot, therefore, be considered a solution available to all mountain communities - and (b) institutional and financial mechanisms are usually insufficient to ensure local participation in and control over the "tourist industry" in the community.

65. While it is true in general that development, in order to achieve sustainability, should take a new and careful look at traditional cultures, practices and skills, this is particularly so in mountain ecosystems and cultures. The attraction of mountain tourism is mainly based on two aspects: the mountain landscape and the culture of the people. The cultural knowledge of mountain people includes engineering (construction of houses, trails, bridges, terraces, irrigation canals, water harvesting and spreading systems); animal husbandry (sheep, goats, camels, yaks and llamas and their products, including clothing, carpets and cheese), traditional dress, dances, songs, musical instruments; rules and regulations for local government and land and water allocation; traditional medicines, medicinal herbs; forest and range products, including a wide range of food sources (mushrooms, berries, roots, leaves, tubers). Sustainable development of mountain ecosystems must build on this knowledge, bearing in mind three aspects: the richness of accumulated traditional mountain cultures; the rate at which this knowledge is disappearing; and the need for the application of state-of-the-art technology (in communication, mountain engineering, energy, risk mapping and early warning systems, local resource management and local government) to enable mountain communities to make a "leap forward", applying modern technology with as much as possible of the traditional culture still intact.

66. Some progress has been made. Government and development agencies are increasingly aware that the limiting factors in sustainable mountain development are not only lack of "assistance" (technical, medical, food), but also lack of "empowerment" (land titles, local autonomy, generation of income). Some

Governments have not only restored land titles to indigenous mountain communities, but have also paid compensation for past damages (in the case of the Pueblo of Zuni in the United States of America, for example).

67. A wealth of new research collaboration involving cooperative arrangements between international institutions and local research organizations has appeared in recent years. CONDESAN is one example. Others include the use of Worldwatch Institute volunteers in mountain ecology research in Eastern Europe; and the work carried out by TMI in Bolivia, China, Nepal and Peru; the collaboration between the United Nations University (UNU) and IMS and the establishment and strengthening of regional mountain associations. On the intergovernmental side, the creation of ICIMOD in 1983, the recent establishment of the Centre for International Forestry Research (CIFOR), at Bogor, Indonesia, the African Highlands programme of ICRAF and the special emphasis on mountains in the programmes of CIP open up new possibilities for support for local mountain research.

D. Recent developments and experiences in international cooperation

1. Intergovernmental processes

68. Several European countries are in the process of revising their forest laws and regulations, especially regarding mountain forests. The Strasbourg Ministerial Conference on Forest Protection in Europe (1990) adopted a resolution on adapting the management of mountain forests to new environmental conditions. A permanent institutional mechanism for follow-up to this resolution, coordinated by Portugal, has been found in the FAO European Forestry Commission Working Party on the Management of Mountain Watersheds. This Working Party, established 42 years ago, with a broad mandate for integrated development in mountain areas in Europe, has the potential of becoming a useful regional vehicle for various aspects of chapter 13 as well.

69. The Alpine Convention, including a Protocol on Mountain Forests, has been negotiated and is now being ratified by Austria, France, Germany, Italy, Liechtenstein, Monaco, Slovenia, Switzerland and the European Union. The Council of Europe is preparing a "European Charter for the Mountain Regions".

70. As recommended by the first ad hoc inter-agency meeting on chapter 13 of Agenda 21 (Rome, March 1994), a series of regional intergovernmental consultations on the follow-up to chapter 13 are to take place during the period 1994-1996. ICIMOD organized the Regional Conference on Sustainable Development of Fragile Mountain Areas in Asia in December 1994. The regional meeting for Latin America and the Caribbean is to be organized by CIP in April 1995. The regional meeting for Africa is tentatively scheduled for October 1995.

2. Organizations of the United Nations system

71. The agencies and organizations present at the first ad hoc inter-agency meeting had generally one thing in common: they all had important activities in

mountain areas but no mountain programme as such. This is especially true for the United Nations organizations including FAO, IFAD, the United Nations Environment Programme (UNEP), UNESCO, the United Nations Children's Fund (UNICEF) and the World Bank, with the exception of UNU, and for the International Union of Forest Research Organizations, an NGO. Organizations with a focus on mountains are those created around mountain issues. They include ICIMOD and CIP and such NGOs as IMS and TMI. Among institutions with a significant interest in mountains, but not present at the inter-agency meeting are IUCN (which has had a Mountain Initiative since 1991), the International Development Research Centre (IDRC), the International Academy of the Environment, regional international development banks, regional mountain associations, ICRAF and UNDP.

72. The organizations present at the inter-agency meeting agreed to establish an E-mail Network on Mountains, as called for by IACSD. This has since been extended to constitute a more complete group of international organizations concerned with the follow-up to chapter 13.

73. Based on the recommendation of the inter-agency meeting, TMI convened an NGO Planning Workshop on the Mountain Agenda in West Virginia, United States of America, from 22 to 26 July 1994.

74. FAO has established a Steering Committee on Environment and Sustainable Development to, among other things, coordinate follow-up for the chapters and activities of UNCED for which FAO is responsible as Task Manager. For chapter 13, a focal point in the Forestry Department has been designated and an Interdepartmental Mountain Group has been established with the participation of nine divisions in addition to the Forestry Department.

75. The first action by FAO, in its role as Task Manager, was to convene the ad hoc inter-agency meeting on chapter 13 (Rome, 21 and 22 March 1994). The meeting was attended by representatives of 13 agencies and non-governmental organizations. 7/ The meeting agreed that it would be necessary to make a special effort to move the issue of fragile mountain ecosystems and the "mountain agenda" higher on the international and national development agendas. It was also noted that no readily available or additional resources had been earmarked for immediate action, as called for in chapter 13. The meeting therefore proposed a series of activities aimed at raising awareness and moving mountain issues higher on the international development agenda. FAO, as Task Manager, was requested to seek donor support for preparatory consultations within a steering committee, as well as a series of regional workshops leading to a world conference on sustainable mountain development to be held in late 1995 or early 1996 (now proposed by FAO for 1997). NGOs were encouraged to establish cooperative mechanisms among themselves for the further development of chapter 13 and to make proposals to the Commission on Sustainable Development at its third session, in April 1995.

76. Examples of past and ongoing action in mountain areas carried out by intergovernmental organizations are given below.

77. Within the CGIAR system, CIP has been designated to coordinate the follow-up of chapter 13. CONDESAN is a participatory research consortium for

the identification, promotion, implementation and monitoring of collaborative activities, including training and information functions. INFOANDINA is the communication and information exchange system of CONDESAN, reaching 70,000 people world wide.

78. FAO is assisting a large number of mountainous countries by providing policy advice, technical assistance and training. This includes programmes on people's participation, with particular attention to the role of women. Sophisticated methodologies have been developed - for example, to match crops to different ecological conditions and to manipulate the vast amount of data on soils, climate and vegetation of mountain areas. Participatory approaches are being developed in soil conservation and land rehabilitation, community forestry and watershed management and other activities related to upland conservation and development in mountain areas. FAO's Agricultural Services Division together with ICIMOD organized the International Workshop on Evolution of Hills and Mountain Farming Systems: Sustainable Development Policy Implications in Nepal in October 1994. A similar meeting will be organized in Ecuador in 1995 in collaboration with CIP. As Task Manager for chapter 13, FAO has established a focal point in its Forestry Department and set up an Interdepartmental Working Group. Pursuant to the recommendation of the first ad hoc inter-agency meeting, FAO's Director-General has called for donors to support the proposed world conference on sustainable mountain development in 1997.

79. The United Nations Centre for Human Settlements (Habitat) is becoming involved with mountain issues through projects dealing with water resources management and the mitigation of flood disasters. A publication on human settlement issues in the sustainable development of mountain areas is planned.

80. ICRAF is launching the African Highlands Ecoregional Initiative, with the overall goal of helping communities in the densely populated and intensively cultivated highlands of eastern and central Africa, in order to alleviate poverty and related social and environmental problems. About 10 national and international research institutions are involved in this project including the International Maize and Wheat Improvement Center (CIMMYT), based in Mexico; CIP, based in Peru; the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), based in India; and the International Livestock Centre for Africa (ILCA), based in Ethiopia.

81. UNEP has been specially concerned with mountains since 1985 through its programme on Andean ecosystem management and regional workshops on mountains. UNEP will contribute especially to chapter 13, programme area A, objective (b): "To maintain and generate database and information systems to facilitate the integrated management and environmental assessment of mountain ecosystems". It contributed to the NGO Planning Workshop on the Mountain Agenda in July 1994 and the Regional Conference on Sustainable Development of Fragile Mountain Areas in Asia, organized by ICIMOD in December 1994 and will contribute to the conference of intergovernmental and non-governmental organizations scheduled for February 1995 and other international meetings on sustainable mountain development. A publication in the Environmental Management Guidelines series, The Integrated Management of Mountain Ecosystems is being finalized.

82. UNESCO contributed to the activities of the "mountain agenda" group through a trust fund contribution from Germany. Activities in the field of sustainable mountain development are mainly carried out within the framework of the MAB programme (more than 40 per cent of all biosphere reserves recognized under MAB are located in mountain areas); the International Hydrological Programme (IHP), which addresses specifically the hydrology of mountainous areas; earth science programmes such as the International Geological Correlation Programme (IGCP), which focuses on geological factors controlling the global environment; and programmes related to the International Decade for Natural Disaster Reduction, which address the vulnerability of, for example, landslide-prone areas using appropriate technologies such as remote sensing and geographic information systems. A synthesis of MAB research in mountains of western and eastern Europe (including the former Soviet Union) was published in the third quarter of 1994. A similar synthesis for tropical mountains is in preparation.

83. UNICEF is represented and active in many mountain countries, especially because mountain people are amongst the most vulnerable, with high child mortality rates. A study on children and poverty in mountains is in preparation. As a follow-up to Agenda 21, the UNICEF Executive Board, in 1993, formally adopted a policy to integrate primary environmental care (PEC) in all UNICEF-assisted programmes. Special attention is to be devoted to mountain areas and other ecologically stressed and vulnerable areas, and greater efforts are to be made in reaching the poorest, whose livelihood has been seriously affected by resource degradation.

84. The UNU mountain programme was initiated in 1978 under the title "Project on highland-lowland interactive systems" and subsequently renamed "Mountain ecology and sustainable development". Its objectives are to train scholars, carry out scholarly and applied research, disseminate results and develop an international mountain network. UNU was a major partner, together with IMS, ICIMOD and others in the preparation and dissemination of the two main publications on mountains issued in preparation for UNCED - The State of the World's Mountains: A Global Report, and An Appeal for the Mountains.

85. The mountain research initiated by UNU has involved extensive field studies in the Himalayas, Thailand, south-west China, the Andes, Ethiopia and Kenya. The work has included studies on natural and man-made mountain hazards, human impacts and human environmental perceptions. Each sub-project has also contributed to the training of young scholars in the host countries. Especially important is the series of challenges to conventional environmental wisdom and the insistence on respect for the indigenous environmental intelligence of the subsistence farmer. In particular, this has led to a deeper understanding of the relationship between deforestation in mountain areas by subsistence farmers (especially in the Himalayas) and downstream devastation on the plains (especially Gangetic India and Bangladesh). The work has been backed up by a long series of regional and international conferences and training programmes, and the publication of their proceedings in the UNU journal, Mountain Research and Development, and other forms. This enabled UNU, in conjunction with IMS, ICIMOD and others, with funding by the Swiss Development Cooperation, to formulate "Mountain Agenda 1992" and so play a major role in ensuring the passage of chapter 13 as part of Agenda 21. The primary ongoing activity involves a major study of a Central Asian mountain transect, including the

Pamirs-Tajikistan-Karakoram-Himalayas-Tibetan Plateau-Hengduan Mountains. This is linked with work being undertaken by two major German programmes, the National Centre for Scientific Research (CNRS) of France, ICIMOD, the Ford Foundation and UNICEF.

86. The World Bank is providing loans to Governments for carrying out about 50 projects specifically in mountain areas, some of which are using highly innovative approaches. Three main areas of challenge have been identified: recognition of mountains as ecosystems; culture in mountain ecosystems; and finance and support for action.

3. Organizations outside the United Nations system

87. The role of NGOs in the follow-up to chapter 13 was confirmed at the first ad hoc inter-agency meeting, which recommended that NGOs initiate a consultative process on the "mountain agenda" and make proposals to the Commission on Sustainable Development. In response to that recommendation, TMI convened the NGO Workshop on the Mountain Agenda (West Virginia, United States of America, 22-26 July 1994), where detailed plans were made for a global conference of intergovernmental and non-governmental organizations on the follow-up to chapter 13, to be held at Lima in February 1995, in time to make proposals for the third session of the Commission, in April 1995. The Workshop also concluded that NGOs would cooperate with Governments in the implementation of chapter 13, as approved by UNCED.

88. It is anticipated that following the interest and constructive commitment of international NGOs, national and local NGOs will become directly involved in the follow-up to chapter 13. Their participation will be increasingly important as implementation of decisions related to the chapter moves from meeting rooms to the field.

89. The International Centre for Alpine Environment (ICALPE) is an independent, international organization which, since 1987, constitutes a permanent scientific basis for research, management and policy actions on environmental and other matters in the mountain regions of Europe, including eastern Europe and the Russian Federation.

90. ICIMOD has the potential to play a key role in implementing chapter 13. It has a strong regional focus (the Hindu Kush-Himalayas region), but a global conceptual orientation. There is a high degree of coincidence between ICIMOD activities and Agenda 21. The Centre has stepped up the process of promoting collaboration in many different fields of key importance to sustainable mountain development. In 1994 alone, 10 workshops and seminars were held, during which scientists and development workers from its eight member countries identified key issues of common interest, and case studies, guidelines and manuals were developed as well as on-farm research and demonstration sites in six countries of the Hindu Kush-Himalayas. In connection with its tenth anniversary, ICIMOD organized an International Symposium on Mountain Environment and Development in December 1993.

91. IMS had a major role in the "mountain agenda" group promoting the mountain cause and in the inclusion of the chapter on mountains in Agenda 21. Much of the present knowledge and clarifications in the discussion on mountains have been developed in partnership arrangements between IMS, UNU, IUCN, UNESCO and ICIMOD. The journal Mountain Research and Development and the International Mountain Network Newsletter could be used as a basis for chapter 13 networks. The President of IMS is currently Chairman of the International Geographical Union's Commission on Mountain Geoecology. Ongoing activities include involvement in a research pilot project of the Yunnan Academy of Social Sciences, China, with support from the Ford Foundation, and UNU/IMS support for the establishment and growth of regional mountain associations: African Mountains Association, East Asia/Pacific Mountain Association and Andean/Latin American Mountain Association.

92. IUCN is involved in supporting national and international mountain initiatives, including the protection of mountain regions through the establishment of national parks and other protected areas. Since 1991, it has had a Vice-Chairman for Mountains in its Commission on National Parks and Protected Areas (covering a network of 180 managers and researchers) and a staff person with part-time responsibilities for mountains. Activities include support for the establishment of the Karakorum National Park in Pakistan and the evaluation of several of the world's most outstanding mountain parks for inclusion in UNESCO's World Heritage List. The total number of mountain protected areas on the List is now 31.

93. The programmes of TMI focus on ecosystem conservation, education and economic opportunity for mountain people and "sacred" mountains, linking culture and natural resource management practices. The Institute was established 20 years ago. Its main achievements are in the areas of base-line surveys and biological databases; applied technology; people and wildlife interactions; mountain agriculture, non-timber forest resources and crafts; training and capacity-building; institutional development; cultural research and preservation, including archaeology; and innovative partnership. TMI organized the highly successful NGO Planning Workshop on the Mountain Agenda in July 1994, laying the foundation for the global conference of intergovernmental and non-governmental organizations in February 1995.

III. CONCLUSIONS AND PROPOSALS FOR ACTION

A. Conclusions

94. Chapter 13 of Agenda 21 (Managing fragile ecosystems: sustainable mountain development) is recognized, not only by Governments and inter-governmental organizations, but also by the international mountain NGO community, as the basic plan of action for the "mountain agenda".

95. The ad hoc inter-agency meeting on chapter 13 convened by the Task Manager, FAO, in March 1994, and the NGO Planning Workshop on the Mountain Agenda convened by TMI in July 1994, have produced a productive cooperative network of intergovernmental and non-governmental organizations concerned with sustainable mountain development. There is agreement that a political and economic

"mountain lobby" needs to be generated, enabling mountain people to fully demonstrate their potential contribution to sustainable development, with a thorough understanding of the specificity of mountain issues, similar to that for small island developing States.

96. The "mountain agenda" therefore includes the launching of a process of preparation of a number of initiatives, particularly through the organization of regional consultations, leading to a major global consultation on sustainable mountain development, including a follow-up plan of action. Multi-donor support and host and sponsoring countries are needed.

97. One of the main difficulties encountered so far is the lack of adequate recognition of mountain areas as something special, with common problems not shared by lowlands, and therefore worthy of special attention. The fragility of mountain ecosystems and the adverse impact of the degradation of those ecosystems on lowland populations have not been fully appreciated. This is reflected in the lack of mountain programmes of agencies, but maybe even more so at the national level, where it is still rare to find departments, programmes or legislation, dealing in a comprehensive way with mountain issues. More often than not mountain areas and populations are at the "thin end" of general national programmes of education, health and infrastructure, mainly because the cost per person of providing such services in remote mountain areas is above the national average and therefore seen by sectoral agencies as uneconomical, and because mountain communities often lack the necessary economic and political influence.

98. The empowerment, equity and equality of mountain women should receive priority attention, together with improved services related to women's specific needs, reproductive health and nutrition; education aimed at closing existing literacy gaps between boys and girls, and between men and women; and ensuring women's access to development and technology transfer programmes.

99. Sustainable mountain development in many places has to start with a change in attitude towards indigenous people and in the way they are treated. Their right to the land should be recognized, as should their knowledge of the special living conditions and natural resource management in the mountains, and they should be protected from exploitation by extractive industries, drug dealers, tourist operators and guerrilla movements. The role of children and youth in sustainable mountain development should also be recognized. Not only will they inherit the responsibility of looking after the environment in the future, but they can also be active supporters of today's endeavour. Their interests can best be served by employing a participatory approach that involves them in the whole process of developing programmes and action plans.

100. A new and hard look needs to be taken at the overall flow of resources and services to and from mountain areas, including water, forest and range products, labour and government services. New or revised water tariffs, forest and mining royalties, grazing rights and leases, marketing of medicinal herbs and other non-wood forest products, fees for access to national parks and licences for tourism operations are all possible income earners for mountain communities, which would in turn allow these communities to invest in, and not receive as government hand-outs, housing, communications, roads, education and nutrition.

Of special interest in financing mountain development is the increasing recognition of the economic value of water (in this connection see chapter 18 of Agenda 21 and the Water Resources Management Policy Papers of the World Bank).

101. Some progress has been made concerning the sustainability of development in mountain areas. Government and development agencies are increasingly aware that the limiting factors in sustainable mountain development is not only lack of "assistance" (technical, medical, food) but also lack of "empowerment" (land titles, local autonomy, generation of income). There is a need to examine the relationship of chapter 13 with other chapters of Agenda 21 and to analyse the extent to which the concerns of mountain areas can be better integrated in the follow-up action on other chapters. Of equal importance is the analysis of ongoing programmes of United Nations organizations, including the World Bank, the CGIAR centres and donor agencies to see how priorities for mountain areas are reflected.

B. Proposals for action

102. The main proposals for action were identified through a broad participatory process involving the major NGOs and were made in five areas in which progress is deemed to be urgently needed: eradicating poverty; strengthening a global information network and database; strengthening country capacity; raising awareness through the preparation and organization of a world conference on sustainable mountain development; and formulating and negotiating regional or subregional mountain conventions and possibly developing a global mountain charter.

103. The estimated average total annual cost of implementing the activities of chapter 13 made by the Conference secretariat prior to the Conference should be reviewed by Governments, leading to readily available or additional resources being earmarked for immediate action, especially action directed towards eradicating poverty. It may be recalled that there are already a number of international, national and local organizations with a mandate in sustainable mountain development, but with severe limitations of staff and funding. Matching their institutional mandate, professional expertise and proved record with adequate financial support would have a direct measurable impact in the short and medium term.

104. Support should be provided for strengthening a global information network and database, as outlined in chapter 13 of Agenda 21, programme area A (Generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems). A small secretariat should be established for this purpose. The proposed lead agency is UNU, in collaboration with FAO, IMS and TMI, among others. The network would provide the linkage between NGOs, regional mountain associations, mountain scholars and academic institutions, and should ensure the process of bringing increased understanding of mountain ecosystems, watershed processes and culture-development processes to decision makers and the public concerned. The network would also promote research and monitoring activities at the grass-roots level. Databases would enable the preparation of atlases that highlighted the global and regional role of mountain ecosystems. Support would be given to regional assessments and surveys,

regional mountain database and information systems and regional action guidelines, as well as to monitoring the state of the environment and development of the world's mountains.

105. Support should be provided for generating country capacity and formulating national mountain action programmes as outlined in chapter 13 of Agenda 21, programme area B (Promoting integrated watershed development and alternative livelihood opportunities). Initially, a small-grants mountain facility would be needed to assist countries in formulating and initiating implementation of sustainable mountain development programmes. Consideration should be given to decentralizing decision-making and programme formulation to the level of administrative units. Proposed lead agencies are FAO, UNDP, UNEP, UNICEF and bilateral donors. Primary environmental care on a watershed basis could provide a conceptual framework, whereas the planning and formulation methodologies developed by TFAP could serve as a model for a country-driven, multi-stakeholder, process-oriented, participatory approach. Increased funding for poverty alleviation as a first step towards sustainable development in mountains is urgently required.

106. The Commission on Sustainable Development may wish to urge interested countries and organizations to promote initiatives aimed at raising awareness, including the organization of a world conference on sustainable mountain development. Host country and sponsoring countries and agencies would need to be identified. It is proposed that such a conference be held early in 1997. In preparation for the conference, regional intergovernmental workshops would be organized. Non-governmental organizations would be actively involved in the process. The three main objectives of the conference would be (a) to mobilize a political and economic "mountain lobby" capable of demonstrating to Governments, policy makers and planners the potential contribution of mountain areas to national and regional development; (b) to introduce the financial and planning instruments needed to incorporate mountain development into national plans and budgets; and (c) to examine the specific human, social and technological characteristics of mountain areas.

107. Support should be provided for the formulation, negotiation and implementation of regional or subregional mountain conventions and possibly the formulation of a global mountain charter.

Notes

1/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

2/ Two main groups of mountainous countries should be considered in this context - those where mountain people and mountain areas constitute the main focus of development (Bhutan, Lesotho, Nepal, Yemen), and those where mountain people and mountain areas are only a part of the national socio-economic scene (China, Ethiopia, India).

3/ In terms of poverty and the impact of environmental degradation, children and women in poor mountain areas constitute the most disadvantaged and vulnerable groups. Statistical data point to some of the highest infant and maternal mortality rates in mountainous regions of developing countries.

4/ A special situation exists in eastern and southern Africa and on a more limited scale in other tropical mountainous countries, in the sense that the uplands, because of their favourable climates and fertile soils, have been occupied by wealthy farmers and farming enterprises. These include tea and coffee estates, forest and fruit tree plantations and cattle and wildlife farms. Long-term sustainability of development in such areas appears to be linked more to socio-political aspects than to environmental considerations, since these areas are not particularly fragile and soil erosion can be kept within acceptable limits. Provided politically acceptable land ownership patterns and levels of employment can be maintained, these uplands have the potential for very high production and income-generation levels and for playing an important role in the national economy.

5/ Report of the International Conference on Population and Development, Cairo, 5-13 September 1994 (A/CONF.171/13 and Add.1), chap. I, resolution 1, annex.

6/ Report of the United Nations Conference on Environment and Development ..., resolution 1, annex II, para. 13.8.

7/ The complete list of agencies involved up to the time of reporting in the E-mail Network on Mountains and with identified focal points for follow-up to chapter 13 include: ILO, UNESCO, World Bank, World Monetary Organization, IFAD, United Nations Industrial Development Organization, United Nations Conference on Trade and Development, UNDP, UNEP, UNICEF, World Food Programme, UNU, United Nations Centre for Human Settlements (Habitat), Department for Policy Coordination and Sustainable Development of the United Nations Secretariat, African Development Bank, ICIMOD, IUCN, IUFRO, TMI, IMS, CIP/CGIAR, CIRAF, IDRC and African Mountain Association. In addition, a number of universities and national NGOs participated in the NGO Planning Workshop on the Mountain Agenda convened by TMI in July 1994, including the International Academy of the Environment (Geneva), Worldwatch Institute, Office of the Governor of the Pueblo of Zuni (United States of America), University of Bern (Switzerland), Charles University of Prague (Czech Republic), the University of San Andrés (La Paz, Bolivia), Earth Council (San José, Costa Rica), the Chinese Academy of Sciences, the South-East Asian Mountain Association, the University of Oxford (United Kingdom of Great Britain and Northern Ireland), King Mahendra Trust for Nature Conservation (Nepal), and the Fundación Peruana para la Conservación de la Naturaleza. The International Centre for Alpine Environment (ICALPE) is also actively involved in international scientific cooperation on environmental issues in mountain areas in Europe.